Module 5: Hands-On: Ansible

Ansible hands-on documentation has been divided into 3 segments:

A. Creating Ansible Playbook
B. Creating Ansible Roles
C. Using Ansible Roles in Playbook

Prerequisites:

1. Ansible needs to be installed in master.
2. Connection between Master and Host needs to be set through ssh. For more information refer to the Ansible Installation Documentation.

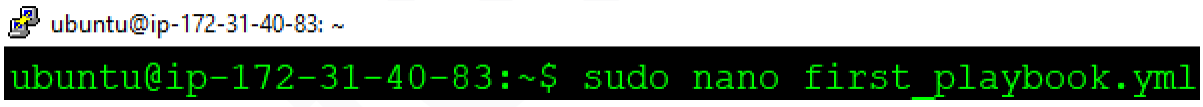
A. Creating Ansible Playbook

This Playbook consists of two plays with following tasks:

- Play 1: Execute a command in host1. Execute a script in host1
- Play 2: Execute a script in host2. Install NGINX in host2

Step 1: Create the .yml file.

```
sudo nano <playbookname>
```



Step 2: Add the following content in the .yml file

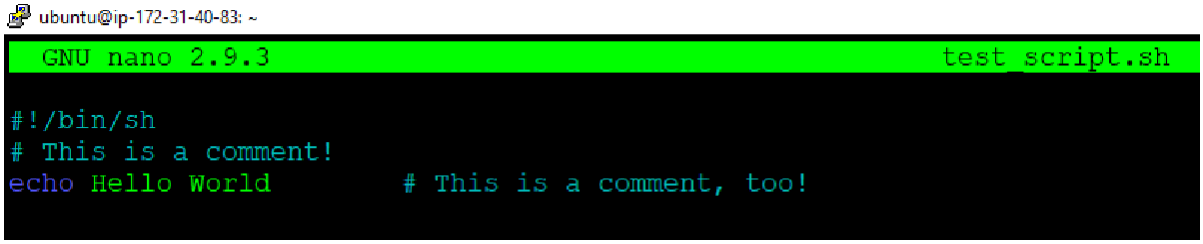
```
---
-hosts: host1 sudo: yes name: Play 1 tasks:
-name: Execute command 'Date'
-command: date
-name: Execute script on server script: test_script.sh
-hosts: host2 name: Play 2 sudo: yes tasks:
-name: Execute script on server script: test_script.sh
-name: Install nginx
-apt: name=nginx state=latest
```

```
---
- hosts: host1
  become: true
  name: play1
  tasks:
    - name: Execute command 'Date'
      command: date
    - name: execute script on server
      script: test_script.sh


- hosts: host2
  become: true
  name: play2
  tasks:
    - name: execute script on server
      script: test_script.sh
    - name: ensure nginx is at the latest version
      apt: name=nginx update_cache=yes state=latest
```

Step 3: Now to be able to perform the "Execute script on server" task we need to have the .sh file (UNIX/ Linux shell executables files) in the master machine. Create test.sh file as shown.

```
sudo nano <file_name>
```



Step 4: Before executing the Playbook that we just created we need to have to check for syntax errors

```
ansible-playbook <playbook> --syntax-check
```

```
ubuntu@ip-172-31-30-9:~$ ansible-playbook first_playbook.yml --syntax-check

playbook: first_playbook.yml
ubuntu@ip-172-31-30-9:~$
```

This means our Playbook is syntax error free. Let us move ahead and execute the Playbook.

Step 5: To execute the Playbook, use the following command:

```
sudo ansible-playbook <playbook>
```

```
ubuntu@ip-172-31-40-83: ~
ubuntu@ip-172-31-40-83:~$ sudo ansible-playbook first_playbook.yml

PLAY [Play 1] ******************************************************

TASK [Gathering Facts] *********************************************
ok: [host1]

TASK [Execute command 'Date'] **************************************
changed: [host1]

TASK [Execute script on server] ************************************
changed: [host1]

PLAY [Play 2] ******************************************************

TASK [Gathering Facts] *********************************************
ok: [host1]
```

Great! We have successfully created our very first Ansible Playbook. Remember that using the Paybook we can run the same command repeatedly but if

everything was configured on the first run then all subsequent runs make no changes.

B. Creating Ansible Roles

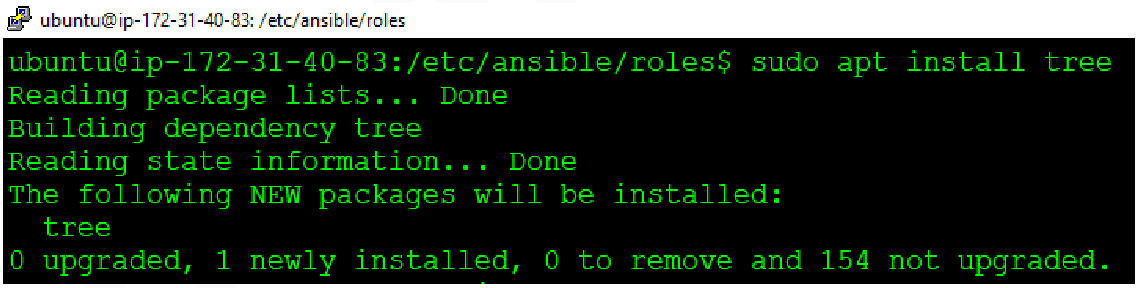
Step 1: Ansible roles should be written inside "/etc/ansible/roles/ ". Use the following command to create one Ansible role

```
sudo ansible-galaxy init <role name>
```

```
ubuntu@ip-172-31-30-9:/etc/ansible/roles$ sudo ansible-galaxy init apache
- Role apache was created successfully
ubuntu@ip-172-31-30-9:/etc/ansible/roles$
```

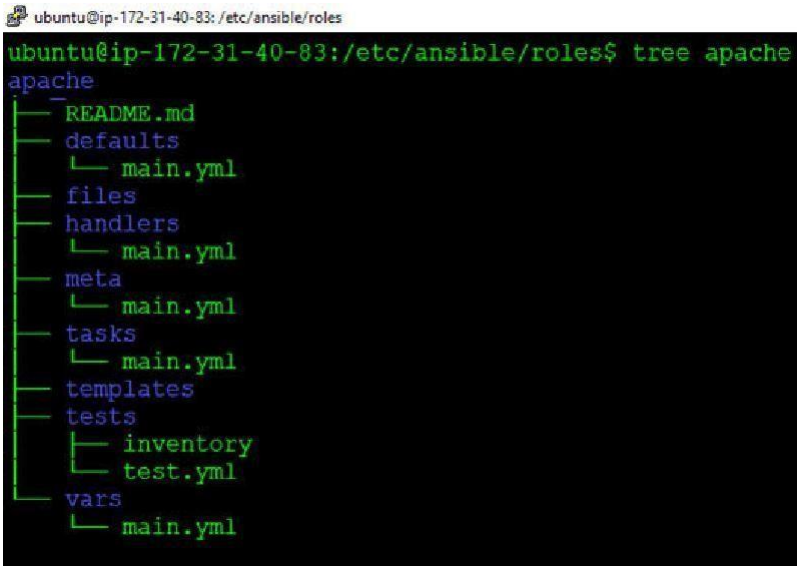
Step 2: Install tree package using sudo apt install tree. Use tree command to view structure of the role

```
sudo apt install tree
```



Now let us see the structure of the role that we just created using the following command:

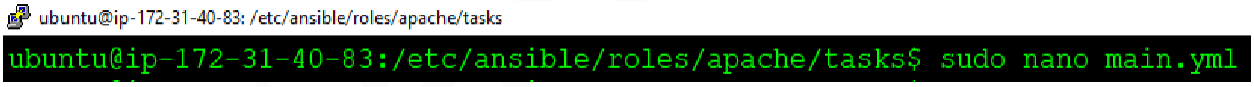
```
tree <role name>
```



Now we are ready to create the tasks that our roles are supposed to perform

Step 3: Go inside the task folder inside the Apache directory. Edit main.yml using the following command. Make changes as shown. Save and then exit.

```
sudo nano main.yml
```



Now we will divide the tasks to be performed into three categories. Install, configure and services. We will create three different .yml files to reduce the complexity. Include those separate task files in the main.yml file as shown.

```
---
# tasks file for apache
-include: install.yml
-include: configure.yml
-include: service.yml
```

```
  GNU nano 4.8                                                main.yml
---
# tasks file for apache
  - include: install.yml
  - include: configure.yml
  - include: service.yml
```

Remember that the order of the list in yml file matters. So here install.yml gets executed first then configure.yml and then service.yml.

Step 4: Now inside the task folder, create install.yml and add the installation tasks to be performed as shown below.

```
sudo nano install.yml
```

```
---
  - name: install apache2
    apt: name=apache2 update_cache=yes
    state=latest become: true
```

```
  GNU nano 4.8                                                install.yml
---
  - name: install apache2
    apt: name=apache2 update_cache=yes state=latest
    become: true
```

Step 5: Then create configure.yml and add the required configurations that need to be performed on remote machine as shown below

```
sudo nano configure.yml
```

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/tasks
ubuntu@ip-172-31-40-83:/etc/ansible/roles/apache/tasks$ sudo nano configure.yml
```

```
---
#configure apache2.conf and send copy.html file
  - name: apache2.conf file
    copy: src=apache2.conf dest=/etc/apache2/
    become: true
    notify:
      - restart apache2 service

  - name: send copy.html file
    copy: src=copy.html dest=/home/ubuntu/
    become: true
```

We will configure apache2.conf file in the remote machine and also, we will restart the Apache2 service. Then we will send one file from /etc/ansible/roles/apache/files folder to the remote machine. The destination path has been set to /home/ubuntu/ as shown.

```
 GNU nano 4.8                                          configure.yml
---
#configure apache2.conf and send copy.html file
  - name: apache2.conf file
    copy: src=apache2.conf dest=/etc/apache2/
    become: true
    notify:
      - restart apache2 service

  - name: send copy.html file
    copy: src=copy.html dest=/home/ubuntu/
    become: true
```

Step 6: Again, inside task folder, create service.yml and add the required configurations that need to be performed on remote machine as shown below

```
sudo nano service.yml
```

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/tasks
ubuntu@ip-172-31-40-83:/etc/ansible/roles/apache/tasks$ sudo nano service.yml
```

We will configure apache2.conf file in the remote machine

```
---
  - name: starting apache2 service
    service: name=apache2 state=started
    become: true
```

```
 GNU nano 4.8                                                service.yml
---
  - name: starting apache2 service
    service: name=apache2 state=started
    become: true
```

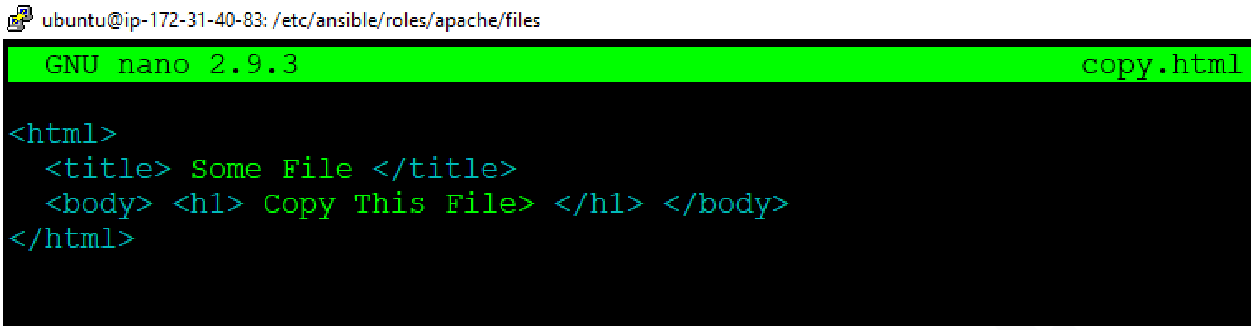
Step 7: Now go inside files. Store the files that need to be pushed to the remote machine. Copy the apache2.conf file from /etc/apache2 directory to /etc/ansible/roles/apache/files and create the html file

```
cp /etc/apache2/apache2.conf /etc/ansible/roles/apache/files
```

```
ubuntu@ip-172-31-40-83: ~
ubuntu@ip-172-31-40-83:~$ cp /etc/apache2/apache2.conf /etc/ansible/roles/apache/files
```

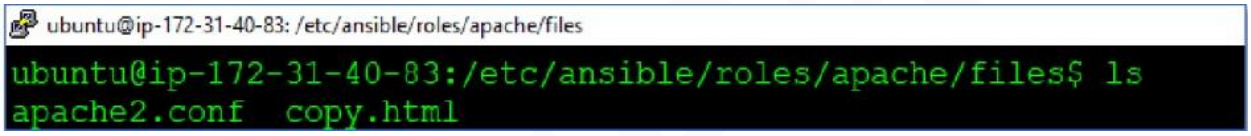
Create one html file as well. My dummy html file looks like this:

```
<html>
 <title> Some File </title>
 <body> <h1> Copy This File> </h1>
</body>
</html>
```



Check whether our files are ready or not by using the following command:

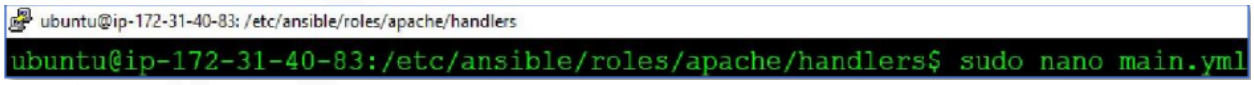
```
ls
```



Step 8: Go inside handlers and add the action that needs to be performed after notify from configure.yml is executed. Use the following two commands:

```
cd /etc/ansible/roles/apache/handlers/

sudo nano main.yml
```



Add the following content inside handlers file:

```
---
#handlers file for apache
  - name: restart apache2 service
    service: name=apache2 state=restarted
```

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/handlers
  GNU nano 2.9.3                                              main.yml

---
# handlers file for apache
  - name: restart apache2 service
    service: name=apache2 state=restarted
```

Remember that notify name and handler name should match:

```
 GNU nano 4.8                                                 configure.yml
---
#configure apache2.conf and send copy.html file
  - name: apache2.conf file
    copy: src=apache2.conf dest=/etc/apache2/
    become: true
    notify:
      - restart apache2 service

  - name: send copy.html file
    copy: src=copy.html dest=/home/ubuntu/
    become: true
```

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/handlers
  GNU nano 2.9.3                                              main.yml

---
# handlers file for apache
  - name: restart apache2 service
    service: name=apache2 state=restarted
```

Step 9: Go inside meta and add information related to the role.

```
cd /etc/ansible/roles/apache/handlers/

sudo nano main.yml
```

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/meta
ubuntu@ip-172-31-40-83:/etc/ansible/roles/apache/meta$ sudo nano main.yml
```

Add author information, role descriptions, company information etc., as shown below:

```
ubuntu@ip-172-31-40-83: /etc/ansible/roles/apache/meta
  GNU nano 2.9.3                                              main.yml

galaxy_info:
  author: Intellipaat
  description: Simple apache role
  company: Intellipaat

  # If the issue tracker for your role is not on github, uncomment the
  # next line and provide a value
  # issue tracker url: http://example.com/issue/tracker
```

Step 10: Go to the /etc/ansible/ and create one top level .ymlfile where we can add hosts and roles to be executed. Execute Apache role on the hosts that is under the group name servers, added in the inventory file /etc/ansible/hosts

```
cd /etc/ansible/
sudo nano site.yml
```

For more than one hosts following commands can be used:

```
---
 - hosts: host1
   roles:
     - apache
```

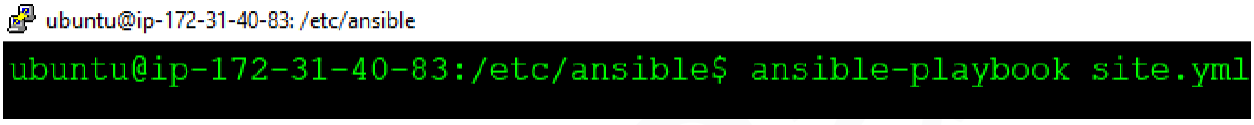
```
  GNU nano 4.8                                                site.yml
---
  - hosts: host1
    roles:
      - apache
```


Step 11: Before we execute our top level yml file we will check for syntax errors and put our configuration in there as shown below.

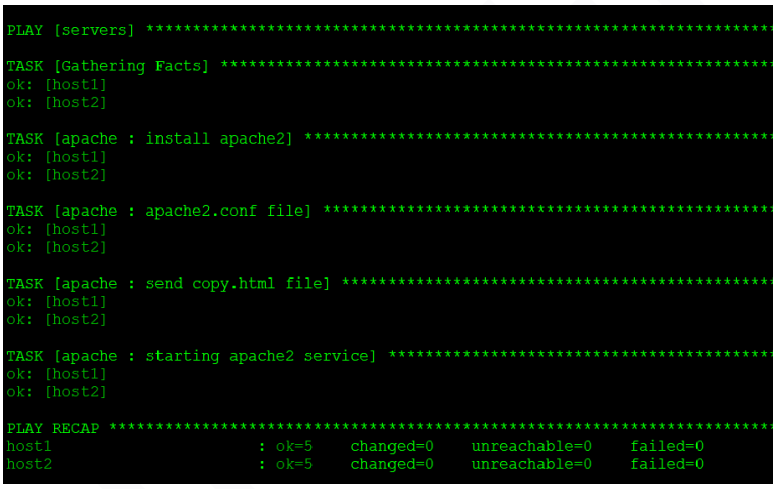
```
ansible-playbook <filename.yml> --syntax- check
```

Step 12: Execute the top level .yml file

```
ansible-playbook <filename.yml>
```



The output looks like this:



Congratulations! You have successfully created Ansible Role. Now let us see how to use this Ansible Role that we've just created along with other tasks in an Ansible Playbook.

C. Using Ansible Roles in Playbook

Step 1: To use Ansible roles along with other tasks in Playbook use import_role and include_role. Create one Playbook called to execute on the remote machines along with two debug tasks before and after Apache role.

```
sudo nano <playbook name>
```

```
ubuntu@ip-172-31-40-83: /etc/ansible
ubuntu@ip-172-31-40-83:/etc/ansible$ sudo nano playbookrole.yml
```

Add the following .yml file as shown:

```
  GNU nano 4.8                                    playbookrole.yml
---
  - hosts: host1
    become: true
    tasks:
    - debug:
        msg: "before we run our role"
    - import_role:
        name: apache
    - include_role:
        name: apache
    - debug:
        msg: "after we ran our role"
```



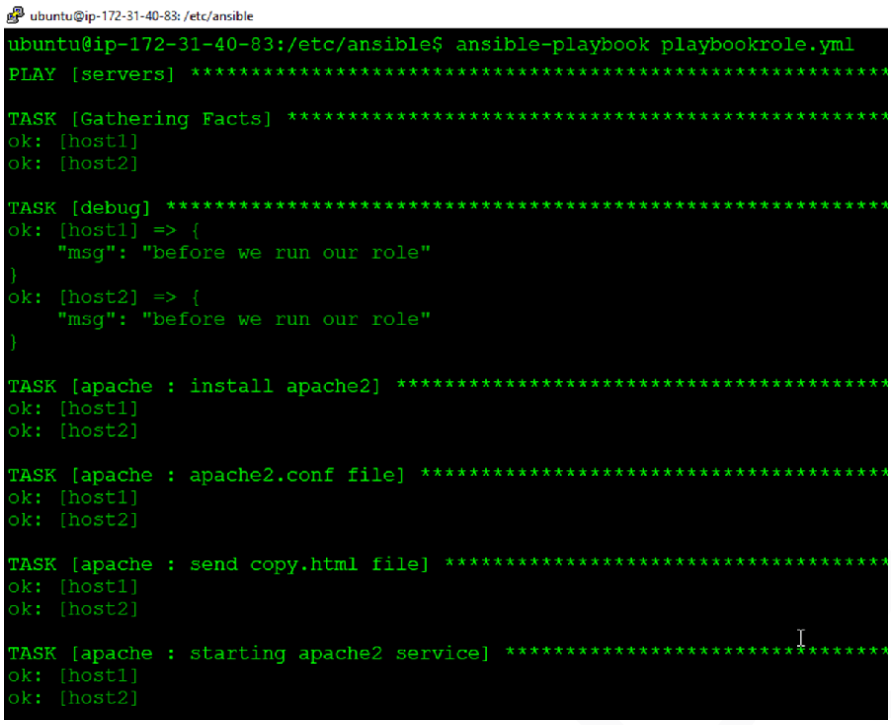
```
---
 - hosts:
   host1
   become:
   true
   tasks:
   - debug:
       msg: "before we run our role"
   - import_role:
     name: apache
   - include_role
     : name:
     apache
   - debug:
       msg: "after we ran our role"
```

Step 2: Check for syntax errors and execute the Playbook with roles

```
ansible-playbook <playbookname> --syntax-check
```

Step 3: Check for syntax error and execute the Playbook with roles

```
ansible-playbook <playbookname>
```

Congratulations! You have successfully integrated Ansible Roles with Ansible Playbook.

